ENVIRONMENTAL
Fact Sheet

NEW HAMPSHIRE DEPARTMENT OF Environmental Services

29 Hazen Drive, Concord, New Hampshire 03301 • (603) 271-3503 • www.des.nh.gov

ARD-9 **2008**

Regulating Nitrogen Oxide Emissions

Ground-level ozone is formed when nitrogen oxides (NOx) combine with other compounds in the air in the presence of sunlight and heat. NOx emissions result primarily from the combustion of natural gas, oil, and coal. Sources of NOx emissions include both major and minor stationary commercial and industrial sources, as well as mobile sources. In other words, NOx emissions come from all types of combustion sources, including power plants, furnaces and boilers, and automobiles.

What is NOx Reasonably Available Control Technology?

In New Hampshire, certain portions of the state exceed the federal health standards for ground-level ozone, a major component of "smog." Since NOx is a precursor to ground-level ozone, the Clean Air Act Amendments of 1990 require New Hampshire to regulate sources of NOx emissions. To meet the federal requirement, New Hampshire adopted Part Env-A 1211 of the Rules Governing the Control of Air Pollution in May of 1994. This rule imposes NOx Reasonably Available Control Technology (RACT) on point sources operating combustion devices or processes which produce NOx emissions. RACT is the application of control technology that is reasonably available and results in the lowest emission limit that is both technologically and economically feasible for a particular source. Techniques to control NOx emissions include combustion modifications, low-NOx burners, overfire air systems, low excess air systems, flue gas recirculation, natural gas reburn, burners out-of-service, fuel switching, selective catalytic reduction, and selective non-catalytic reduction.

The NOx RACT rule establishes emission limitations for utility and industrial sources of NOx which will enable New Hampshire to take a major step forward in achieving federal ozone attainment demonstrations, thus reducing the likelihood of more stringent regulations being imposed on the business and industrial community.

Provisions of the NOx RACT Rule

The NOx RACT rule applies to facilities that are defined as "major" sources of NOx. A major source is a source that emits or has the potential to emit 50 tons per year or more of NOx. If a source is major, the rule may apply in two ways: (1) by regulating a device classified in a specific category; or (2) by regulating any unclassified NOx emitting device located at the source.

Within each specific category, the regulatory requirements may vary depending on a device's size and/or the type of fuel it burns. Specific source categories covered by the rule include utility boilers, steam electric boilers, industrial boilers, stationary combustion turbines, stationary internal combustion engines, asphalt plant dryers, incinerators, wallboard dryers, emergency generators, auxiliary boilers, and load shaving units.

Special provisions in the rule, specifically Env-A 1211.05 (b), apply to certain boilers. These “boiler tune-up” provisions allow steam electric boilers, industrial boilers, and utility boilers, with heat input rates of less than 50 million Btu per hour located at a major NOx source, to annually adjust the combustion process as a way to meet the RACT requirements. For example, a 9,000,000 Btu industrial boiler located at a major NOx source would have to comply with the tune-up provisions and the recordkeeping and reporting requirements of the rule.

Additionally, special provisions apply to emergency generators. An emergency generator is defined as a stationary internal combustion engine or stationary combustion turbine used to provide mechanical or electrical power only when the primary power source for a facility has been lost during an emergency or during normal maintenance and testing procedures. The term does not include a load-shaving unit or peaking power production unit, but does include the operation of the emergency generator during periods in which ISO New England directs the implementation of operating procedures for voltage reductions, voluntary load curtailments, or automatic or manual load-shedding (known in the industry as Operating Procedure No. 4, Action 12). Emergency generators located at major NOx sources are exempt from RACT requirements if the generator is operated less than 500 hours per year and total NOx emissions at the source from all emergency generators combined are less than 25 tons per year, as provided in an enforceable permit issued by the New Hampshire Department of Environmental Services.

General provisions in the rule which apply to all affected sources include NOx stack testing requirements [Env-A 1211.20] and NOx monitoring requirements [Env-A 1211.21]. The rule also provides flexibility to affected sources by offering a number of compliance options, including:

- Alternative RACT emission limits [Env-A 1211.15].
- Multiple sources under common ownership [Env-A 1211.16].
- Issuance of a RACT Order [Env-A 1211.18].
- Seasonal control of NOx emissions [Env-A 1211.19].

Complying with the Rule

Owners and operators of affected sources have a variety of compliance obligations, again depending on the applicable category, the size of the device and the type of fuel being burned. Some devices may only have to perform annual tune-ups and meet recordkeeping and reporting requirements. Other devices will be required to meet more stringent standards, including performance of regular stack testing and installation of continuous emissions monitoring (CEM) equipment.

Since the NOx RACT rule only applies to major sources, a facility could “permit-out” of the rule under two conditions. First, the source's actual emissions must not have equaled or exceeded 50 tons per year during any consecutive 12 months since January 1, 1989. Second, the source must be willing to accept an enforceable permit limiting its actual emissions below the major source threshold, becoming what is referred to as a “synthetic minor.” If a facility cannot permit-out of NOx RACT, it must carefully assess its emissions. The source must determine which sections of the rule apply to specific devices at the facility and whether the miscellaneous stationary source provision captures any additional devices. Finally, since the NOx RACT rule has been structured to allow for some creative flexibility, the source should carefully assess its compliance options.

For more information on the NOx RACT rule or New Hampshire's air pollution permitting program, contact the NH Department of Environmental Services Air Resources Division, 29 Hazen Drive, Concord, NH 03301 (603) 271-1370.